

REMARKS

Claims 1, 2, and 10 have been amended by the present amendment. Support for the same may be found at least on pages 14 and 18 of the specification as originally filed. No new matter has been added.

Claim Rejections 35 USC § 103

Claims 1-7, 9-14, 16, 18, 22, 24-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chang et al. (5,405,680), and further in view of Smith et al. (4,751,115). Applicant respectfully traverses.

The Examiner alleges with respect to Claims 1 and 10 that Chang et al. disclose in Figures 3 and 4 a method of radiating thermal energy from a terrestrial position into deep space, and a device for transmitting thermal energy from an object into deep space comprising arranging a thermal energy transmitting material (coating 14) over an object (window 12 of automobile 10); and positioning the thermal energy transmitting material so that a transmitting surface thereof faces deep space, wherein the object includes objects (vehicles and building structures) on the surface of the earth and proximate thereto.

The Examiner further alleges that the material of Chang et al. would obviously provide the claimed spectral surface properties, as the material of Chang et al. has the same physical characteristics as that disclosed in the instant case, which allegedly discloses a material characterized by high thermal emissivity in the 8-13 μm wavelength region.

The Examiner admits that Chang et al. do not disclose that the thermal energy transmitting material is configured and removably positioned to remove waste heat proximate the object. However, the Examiner alleges that Smith et al. disclose in Figure 2 a sun screen 10 having sun reflection and solar heat absorption characteristics that is configured and removably positioned (i.e. the film is in the form of a sunscreen that can be installed or disassembled) to reduce interior heat within an object (an automobile) by removing waste heat.

The Examiner concludes that therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Chang et al. by providing the sunscreen of Smith et al. because both are concerned with reflection of solar

radiation and Smith et al. teach a sunscreen that would have provided an inexpensive means for reducing the interior temperature of an automobile by employing combined solar reflective and sun absorption characteristics in the form of a screen that may be readily installed or disassembled thereby reducing maintenance cost associated with damage to the interior of the car due to the sun.

It is respectfully noted that Chang et al. teach a selective emissivity coating that is provided for interior temperature reduction of an enclosure such as vehicles or buildings. Col. 3, lines 47-49 and Abstract. The coating may be applied to the exterior surface of vehicle and building windows, or to the exterior, non-window surfaces of building structures. For the latter, the coating may take the form of a conventional paint to which is added tiny particles of the semimetal and selective emissivity materials to achieve the radiative cooling and reflection of incident infrared radiation. See Abstract. The material serves to reduce the solar heat load by reflecting the incident solar infrared radiation. Thus, Chang et al. teach a fixed coating applied to an object, such as a vehicle or building, to reduce the temperature of a closed space heated by solar energy. Chang et al. teach only reducing temperature in an enclosure resulting from solar energy.

Chang et al. do not teach or suggest arranging a thermal energy transmitting material over an object not is direct sunlight, said thermal energy transmitting material configured and removably positioned to remove waste heat proximate and external said object thereby reducing thermal pollution from a terrestrial position into deep space, as in amended Claim 1 and similarly claimed in Claim 10. Thus, it is respectfully submitted that Claim 1, and the claims depending from Claim 1, i.e., 2-9, 24 and 26, define over Chang et al. Likewise, it is respectfully submitted that Claim 10, and the claims depending from Claim 10, i.e., 11-18, 22, 23, 25, and 27, define over Chang et al.

Likewise, Smith et al. teach only reducing temperature in an automobile interior resulting from incident solar energy. More specifically, Smith et al. teach a sun screen or poster screen which incorporates both sunray reflection and solar heat absorption characteristics to reduce the interior auto temperature when the screen is installed against the windows of the automobile. Col. 1, lines 56-60. The sun screen includes a backboard 24 on which a thin film of reflective material 25 is laminated therewith. The reflective coating or film 25 includes pictorial subject

matter which ranges in density from a relatively opaque section represented in general by numeral 26 to a relatively translucent section indicated by numeral 27. These latter sections or portions provide a differential in sunlight reflection that provides an overall muted effect so as not to be bothersome to oncoming traffic or oncoming observers. Col. 3, lines 14-23.

Once installed (*i.e., placed against the back side of the windshield inside the automobile*) (see col. 3, lines 59-63), the reflective surface of the graphic film will reflect oncoming sunrays through the windshield so that these rays are not only blocked from entering the interior of the vehicle but the rays are deflected exteriorly from the vehicle. Smith et al. also teach that it is to be understood that the corrugated board absorbs heat whereas prior art's devices merely block sunrays. This is why conventional devices are referred to simply as shades or shields. Col. 4, lines 4-14.

Thus, Smith et al., like Chang et al., teach a fixed coating applied to an object, such as a backboard to be placed in the interior of an automobile, to reduce the temperature of a closed space heated by solar energy. Smith et al., like Chang et al., teach only reducing temperature in an enclosure resulting from solar energy. Smith et al. merely teaches a partial or muted reflective coating applied to the backboard, wherein incident solar radiation that is not reflected by the reflective coating is allowed to pass therethrough and the corresponding heat is absorbed by the backboard instead of another object in the interior of the automobile (*i.e., seat, steering wheel, etc.*). In other words, the only aspect of the sun screen reducing the interior temperature of the car is the reflective coating while the backboard absorbs heat that is allowed to pass through the translucent portions of the reflective coating. In this manner, the backboard absorbs the heat instead of objects in the interior of the automobile, however, the backboard does not reduce the interior temperature as a result. The difference is that the backboard will absorb the heat while reducing wear and tear of the interior of the automobile and increase comfort of occupants coming into contact with the interior of the automobile.

Furthermore, Smith et al. only teaches removably positioning the sunscreen against the windshield in the interior of the automobile and does not teach or suggest removably positioning the same over an object not in direct sunlight (*i.e., over the windshield*) such that it is in direct fluid communication with the sun. As one of ordinary skill, as well as one of ordinary skill in the art, would not be motivated to modify Smith et al. to removably position the sunscreen of Smith

et al. over the windshield on the exterior of the automobile for obvious reasons. For example, one of ordinary skill would not be motivated to dispose a sun screen on the exterior of the automobile over the windshield, as it would be exposed to the elements and subject to deterioration, blowing away, or theft.

Neither Chang et al. nor Smith et al., alone or in combination, teach or suggest arranging a thermal energy transmitting material over an object not in direct sunlight, said thermal energy transmitting material configured and removably positioned to remove waste heat proximate and external said object thereby reducing thermal pollution from a terrestrial position into deep space; and positioning said thermal energy transmitting material so that a transmitting surface thereof faces deep space such that fluid communication therebetween consists of deep space and the transmitting surface, as in amended Claim 1 and similarly claimed in claim 10. Thus, it is respectfully submitted that Claim 1, and the claims depending from Claim 1, i.e., 2-9, 24 and 26, define over Chang et al. Likewise, it is respectfully submitted that Claim 10, and the claims depending from Claim 10, i.e., 11-18, 22, 23, 25, and 27, define over Chang et al.

Moreover, with respect to Claim 2, it is respectfully submitted that Smith et al. teach employing the sunscreen for the purpose of incident solar energy acting on the vehicle, specifically directed on the windshield. However, Applicant discloses with respect to Claim 2, wherein said object is covered with the transmitting material only at intervals during which the object is not in direct sunlight. Neither Smith et al., nor Chang et al., alone or in combination, provide any suggestion or motivation for employing either of the respective inventions shaded from direct sunlight and only at intervals during which the object is not in direct sunlight, as in Claim 2. On the contrary, it is respectfully submitted that Smith et al. teach just an opposite corollary, i.e., to employ the sun screen only at intervals during which the objects are in direct sunlight. Thus, Smith et al. clearly teach away from Claim 2.

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held

improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

More specifically, the Examiner alleges that it would have been obvious to have modified the method of Chang et al. by providing the sunscreen of Smith et al. However, the sun screen of Smith et al. will not work with the Chang et al. coating. It is respectfully noted that it is well known in the pertinent art that the lion's share (i.e., about 95%) of the solar energy that enters through glass is in a wavelength band of about 0.3 μm to about 2.7 μm . Therefore, the sun screen can reflect this energy right back out through the glass in which it entered. That is, the sun screen can only reflect solar energy back through the glass and out of the interior of a vehicle or building. The window glass will block or absorb emitted energy from within the vehicle (or building) because the window glass will not pass energy any longer than about 3 μm . "Infrared energy cannot travel through certain window glass (typically silica, fused silica, borosilicate, etc.), yet it can travel through the atmosphere." See page 14 of the originally filed application. The wavelength band of about 8 μm to about 13 μm band taught in Chang et al. is too long for the glass to allow it to pass through. In other words, window glass will not transmit IR energy above approximately 3 μm . Therefore, only the reflected solar energy can leave the vehicle or building through the glass.

Any emitted energy in the wavelength band of about 8 μm to 13 μm inside the vehicle will be blocked by the glass. So it is respectfully submitted that there is no suggestion or motivation in either Chang et al. or Smith et al. to modify the method of Chang et al. transmitting in the 8 μm to 13 μm by providing the sun screen of Smith et al. with the coating of Chang et al., because the coating of Chang et al. transmitting in the 8 μm to 13 μm will not leave the vehicle or building. Thus, there is no suggestion or motivation to put the Chang et al. material on the sun screen of Smith et al.

Moreover, both Chang et al. and Smith et al. are concerned with solving a different problem that the Applicant is concerned with. More specifically, both Chang et al. and Smith et al. are

concerned with reducing the solar heat build up in an interior enclosure caused by incident solar energy acting on the enclosure, specifically widow glass thereof. Both Chang et al. and Smith et al. teach removing the solar heat from the enclosure in direct sunlight to the ambient air which surrounds the enclosure, thereby in effect, heating the ambient air proximate and external the enclosure. Applicant teaches solving the problem of removing waste heat other than solar heat proximate and external an object (e.g., enclosure) not in direct sunlight and transmitting the waste heat to deep space. In fact, both the inventions of Chang et al. and Smith et al. may be used in conjunction with the Applicant's invention solving two separate problems, i.e., reducing the interior temperature of an enclosure using Chang et al. and/or Smith et al. and then reducing the temperature proximate and external the enclosure by using the transmitting surface taught by Applicant, albeit in the shade or only at intervals not exposed to direct sunlight (e.g., at night, or overcast conditions).

Applicants further maintain that the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hind sight which fails to consider the totality of applicant's invention and to the totality of the cited references. More specifically the Examiner has used Applicant's disclosure to select portions of the cited references to allegedly arrive at Applicant's invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicant's invention as a whole in contravention of section 103, including the disclosures of the references which teach away from Applicant's invention.

Section 103 sets out the test for obviousness determinations. It states, in pertinent part, that such determinations are to be made by consideration of

... the differences between subject matter sought to be patented and the prior art such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the [pertinent] art.

In making a Section 103 rejection, the Examiner bears the burden of establishing a prima facie case of obviousness. In re Fine, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1998). The Examiner "... can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in art would lead that individual to combine the relevant teachings of the references". Id.

In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has

consistently held that one must consider both the invention and the prior art "as a whole", not from improper hindsight gained from consideration of the claimed invention. See, *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein.

According to the *Interconnect* court

[n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.

Id. Also critical to this Section 103 analysis is that understanding of "particular results" achieved by the invention. *Id.*

When, as here, the Section 103 rejection was based on selective combination of the prior art references to allegedly render a subsequent invention obvious, "there must be some reason for the combination other than the hind sight gleaned from the invention itself." *Id.* Stated in another way, "[i]t is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch* 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

It is respectfully submitted as discussed above that an artisan would realize that material of Chang et al. disposed on the sun screen of Smith et al. will not function inside the car, and since Smith et al. make no mention of waste heat, and since Chang et al. address only removal of trapped solar energy inside the car, there is no technological reason to combine the Chang et al. material with the sun screen of Smith et al., as it will not function within in the automobile. Thus, it is respectfully submitted that there is no reason for the combination other than hindsight gleaned from applicant's disclosure.

Furthermore, it is respectfully pointed out that neither Chang et al., nor Smith et al., alone or in combination, teach or suggest removal of "waste heat" proximate and external said object thereby reducing thermal pollution from a terrestrial position into deep space, as defined in the Applicant's specification as originally filed and claimed. As discussed above, both Chang et al. and Smith et al. merely teach removal of solar energy and not "waste heat" from the interior of an enclosure in direct incident sunlight. Moreover, it can hardly be said that solar energy is considered as thermal pollution in the pertinent art, such that removal of solar energy would reduce thermal pollution. Still further,

even if solar energy could be considered as such, all Chang et al. and Smith et al. disclose is removal of solar energy from inside an enclosure (i.e., automobile or building interior) and does not teach or suggest removing waste heat proximate and external the object reducing thermal pollution from a terrestrial position into deep space as connoted by one of ordinary skill in the art and as defined in the specification. Therefore, it is respectfully requested that rejection with respect to Claims 1 and 10, including claims depending therefrom, i.e., Claims 2-9, 11-18, and 22-27, be withdrawn.

Claims 15 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. as applied to claims 1 and 22, respectively, above, and further in view of Stearns (3,053,923).

The Examiner admits that Chang et al. do not disclose that the thermal transmitting material is disposed within a pressure cell having a pressure less than ambient. However, the Examiner states that Stearns in Figure 4 discloses thermal transmitting material (58 and 64 of aluminum) disposed within a pressure cell having a pressure less than ambient (gas-tight, transparent envelop 72). The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Chang et al. by using the pressure cell of Stearns because Stearns discloses a pressure cell that would have prevented hot junctions from being cooled by convection thereby improving the overall performance of the method.

It is respectfully noted that Claims 15 and 23 depend from Claim 10 which is allowable for defining over Chang et al. as discussed above. It is further respectfully noted that the use of pressure cell of Stearns does not cure the deficiencies noted above with respect to Chang et al. Thus, Claims 15 and 23 define over Chang et al. in view of Stearns.

Claims 8 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. as applied to claims 1, 10, 11, and 16 above, and further in view of Altman (4, 147,040).

The Examiner alleges that Altman discloses a spectral substance (infrared radiation transmitting material) selected from the group consisting zinc sulfide and zinc selenide.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Chang et al. by using the

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spectral substance of Altman because Altman teaches a spectral substance that would have provided for a continuous, uninterrupted and unobscured flow of heat from a subject surface to a heat sink and through a heat conduit thereby improving the overall method for cooling a subject thermal load that emit infrared radiation.

It is respectfully noted that Claims 1 and 10 including claims depending therefrom, i.e., 8 and 17, respectively, define over Chang et al. as discussed above. It is further respectfully noted that the use of the spectral surface of Altman does not cure the deficiencies noted above with respect to Chang et al. Thus, Claims 8 and 17 define over Chang et al. in view of Altman.

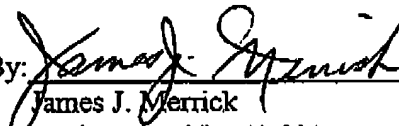
It is believed that the foregoing remarks fully comply with the Office Action. Therefore, having placed the claims in an allowable condition, reexamination and allowance of claims 1-27 are respectfully requested.

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If there are any charges with respect to this amendment, or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant's attorneys.

Respectfully submitted,
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